same condition of feet is found in that species. The feet, indeed, are larger than those of *exilipes*, and the tarsi, particularly, are long; but the toes are still notably short, in a relative sense, not having increased *pari passu* with enlargement in other respects. I would attempt to explain this fact in the same way.

So far as I know, the claws of *Ægiothus* have not been modified coincidentally with those changes that have made the several races what they are. The claws of *exilipes* and *canescens*, indeed, are longer, compared with the toes, than those of other forms; but this a relative, not absolute difference. The claws of all the species are liable to vary within rather wide limits,—this discrepancy belonging clearly, however, to the class of individual peculiarities.

The conclusions to be drawn from the foregoing facts are obvious. We have seen that *canescens*, the form most strongly differentiated at present, is also the one most easily accounted for by the operation of certain known laws that produce variation in species. If this were not a separate and independent creation, it must have been evolved at some time out of *linarius*. The question of its specific distinction, then, is merely a question of time; we can only say that it has divaricated further than any other known forms from the original standard, and that, though it has reached a point where most ornithologists would draw a dividing line quâ species, yet it is really only a variety of *linarius*. *A fortiori*, in the case of all the other above described modifications of *linarius*, we have varieties, not species. Simply, they have not progressed so far in the process of differentiation; they either began to be modified later, or the modifying influences have not been so effectual towards that end. But if *canescens* is a "species," so also is each of the others. There are only involved differences in degree, not in kind.

The Law of Development in the Flowers of AMBROSIA ARTEMISIÆFOLIA.

BY THOMAS MEEHAN.

In the fruit of *Ambrosia artemisiæfolia* the perigynium is crowned with a series of horns. I propose to show that these are all that remains of other flower buds, which have been absorbed by their elder sister during infancy.

It is not generally known that this species is occasionally diœcious, though Dr. Darlington in his *Flora cestrica* makes note of the fact; nor is it known to the mass of botanists that a peculiar form of neutral flower exists, though many years ago Torrey & Gray (*Flora of North America*) briefly alluded to it. These diœcious forms and neutral flowers afford the key to the whole structure.

In the regular form of this species the sequence of the flowers is according to the laws recently developed in my papers on sex. The female flowers receive the plants' first and greatest care, and always appear in the lines of strongest vitality, of which a vigorous axial development is one striking type. The male flowers only appear in the weaker lines, after the cohesive force so essential in building up the woody axis has been considerably spent. In the purely pistillate forms we almost always observe an unusual axial activity. The female flowers in the regular forms are sessile in the axils of the leaves; but in the mostly pistillate forms they are generally elevated on short peduncles, giving the plants a peculiar twiggy appearance. On the other hand, the nearly male plants, which by the way are rarely seen, present characteristics the reverse of these. The heads, usually female, when appearing as male flowers, exist as large burrs tightly set in the axils, without the slightest tendency to pedunculation. Though varying in intensity, and occasionally intermingling, no one can fail to see that these forces prevail in these forms—the feminine, in connection with cohesive and vital activity in the axillary parts —the masculine, with weakened axillary activity, and individualization.

The flowers themselves, however, afford a better illustration of this than the

supporting parts. The male flowers are five to eight in each involucral cup. —in the female they are single; but in place of flowers the female has five to eight horns on the perigynium. The want of correspondence in number in parts which were no doubt embryologically the same, together with a correspondence in the number of the horns on the perigynium, would naturally suggest to one acquainted with the absorbing or coherent power of the female influence that the primordial bud had absorbed the rest, of which all that remained were these horns. This I subsequently proved to be more likely by the discovery of *two forms of perigynia*. Occasionally three female flowers appear in one involucral cup. In such cases the two lateral ones have, mostly, no horns, or rarely one or two; while the central one has but from four to six—evidently a less number than others which have no side flowers with them. In the male flower we find two forms; the perfect ones with five broad anthers, abundantly polleniferous, without horns, and without any attempt at producing a style. The other class has anthers which seem never to produce perfect pollen, but are projected into a "setiform inflexed appendage" or horn, and have a single sterile style which is capped by a numerously rayed stellate apex. Torrey & Gray (*Flora N. M. Page* 290) notice this form of flower, but err in evidently believing it universal; while other authors seem to refer to the former, ignoring or ignorant of the existence of the latter.

The absence of a style in connection with perfect anthers, and the attempted production combined with the dificiency of pollen in the neutral ones, show an evident progress towards a female stage; and also it is clear that with this progression is *a tendency to cornution in the parts absorbed.* I pointed out to some of our botanical friends in the Academy some weeks ago, that from these circumstances the horns on the perigynium could scarcely be anything else but the *remains of absorbed flower buds.*

I have now found a specimen which affords the practical demonstration of these truths—a female plant not a foot high, with enough of the cohesive power to give it an entire female character, but not to the same extent that more vigorous forms possess. The horns are in *every state of gradation from their usual condition on the perfect perygnia to petaloid scales, down to perfect flowers with the regular twin styles;* though adherent by their bases to the central or main flower. Only for this early cohesion with, and thus a reception of the female influence, the lower ones would undoubtedly have been male flowers.

I present this specimen, together with a suite of the others referred to, for the Society's herbarium.

I may be again permitted to repeat what I have frequently said already in papers before this and kindred associations, that there are probably in plants two distinct principles going along together—the one *hereditary*—a conservative, coherent, female force, which, as the very existence of all things depends on it, nature throws in and around it her strongest vital powers;—and *variation* a progressive, radical principle, the only object of which is to prevent stagnation,—to seggregate and disperse rather than unite and preserve,—and by giving varied form to matter, is the source of the endless changes which give beauty and interest to the other;—less vital, less essential, less cared for by nature because she reproduces herself by buds, tubers, suckers, roots, and many other ways *when she does not care for variety*, without it, but not less essential to our pleasures and intellectual progress, and indeed the eternal progress of all things.

I submit this paper as another contribution to a theory which may not yet appear to others so clearly a law, as it continues by almost daily observations to grow on myself.

Nov. 2nd, 1869.

Mr. Isaac Lea in the Chair.

Twenty-nine members present.

The death of Dr. T. H. Turner, U.S.A., was announced.

[Nov.